Commentary: Glaucoma drainage device and retinal detachment

Any intraocular surgery carries with it the risk of developing a rhegmatogenous retinal detachment (RRD). The risk is less than 1% in a phacoemulsification surgery for cataracts; however, the risk is higher (~21.5%) after a complicated surgery such as the Boston keratoprosthesis.[1,2] The major risk factors predisposing to RRD were seen to be the presence of posterior capsular tear, zonular dehiscence, previous RRD, axial length >23 mm, increasing age, and male gender.[1] In contrast, in the Boston keratoprosthesis surgery, a significantly higher incidence of RRD occurred in patients who had excessive inflammation postoperatively, underlying autoimmune systemic disease, history of laser posterior capsulotomy, and tube shunt placement.[2] Surprisingly, the type of surgery (i.e., phacoemulsification or extracapsular extraction), anterior vitrectomy, and type of anesthesia did not have a significant correlation with the development of RRD.[1]

The incidence of RRD following a glaucoma drainage device (GDD) implantation has been variously reported to be from 1.5% to 5%.[3-7] Babu *et al*. reported a low incidence

of RRD following implantation of the non-valved Aurolab aqueous drainage implant (AADI).[8] Although the AADI is also performed in eyes with fairly advanced complications, the RRD rate is somewhat similar to that after a phacoemulsification surgery. Nonetheless, it pays to be cautious and select appropriate cases for such procedures. As the GDD involves excessive manipulation and sudden change in the intraocular pressure, it has the potential to cause retinal tears.[6] Thus, the guidelines used for patients undergoing laser in-situ keratomileusis appear to hold true in this situation too. It would be better to treat any patients with preexisting lattice degeneration or retinal holes. Patients with a previous retinal detachment surgery are at a higher risk as has been shown by Babu *et al*. and others.[3,8] Eyes with previous trauma or uveitis should be examined thoroughly prior to placing the GDD and treated adequately to reduce the risk of RRD. Occurrence of choroidal effusion due to hypotony and suprachoroidal hemorrhage are potential risks with a non-valved GDD such as the AADI. Care must be taken to do adequate vitrectomy in eyes where the drainage tube of the GDD is placed in the pars plana to prevent vitreous incarceration in the tube leading to vitreous traction and retinal breaks.[3]

The management of RRD in a case of GDD poses some unique challenges. Most of these eyes have a very stormy course with multiple surgeries and may end in a poor outcome. The case series presented by Babu *et al*. also showed poor outcomes, with retinal reattachment achieved in 60% of eyes and 20% of eyes becoming phthisical.[8] They elaborated these challenges in the management of RRD well. A scleral buckle and/or an encircling band is not preferred due to the obstruction by the GDD unless the RRD can be managed by a simple segmental or radial buckle in an isolated quadrant well away from the quadrant of the GDD. Otherwise, pars plana vitrectomy is the preferred method for RRD management. However, each step of the surgery—from making the sclerotomies till the conjunctival closure—needs to be done with extra care to prevent complications. In case of the use of silicone oil for tamponade, the GDD tube should be repositioned from the pars plana into the anterior chamber to prevent the oil from blocking the tube. A temporary ligation of the tube at the time of silicone oil insertion can be done to prevent leakage of oil to the subconjunctival space. In eyes with RRD and GDD, pneumatic retinopexy would be an ideal choice for the eligible eyes.[9] In select eyes with superior breaks and fresh RRD without proliferative vitreoretinopathy, it offers a safe solution without the risk of silicone oil migration. With a close watch on the intraocular pressure and its timely management, a good outcome can be achieved.

The management of RRD in patients with a GDD *in situ* is challenging. The goal of the vitreoretinal surgery in this scenario is retinal reattachment without disturbing the functioning of the GDD. Despite this, the functional outcomes in such situations are often dismal mainly due to the preexisting advanced glaucomatous damage. Meticulous surgical techniques and an integrative approach with close monitoring of both the retinal status and the intraocular pressure is crucial in maintaining the existing vision in these patients.

Dhanashree Ratra, Sashwanthi Mohan

Department of Vitreoretinal Diseases, Medical Research Foundation, Sankara Nethralaya, Chennai, Tamil Nadu, India

Correspondence to: Dr. Dhanashree Ratra, Senior Consultant, Department of Vitreoretinal Diseases, Medical Research Foundation, Sankara Nethralaya, 41/18, College Road, Chennai - 600 006, Tamil Nadu, India.
E-mail: dhanashreeratra@gmail.com

References

1. Tuft SJ, Minassian D, Sullivan P. Risk factors for retinal detachment after cataract surgery: A case-control study. Ophthalmology 2006;113:650-6.
2. Jardeleza MS, Rheaume MA, Chodosh J, Lane AM, Dohlman CH. Retinal detachments after Boston Keratoprosthesis: Incidence, predisposing factors, and visual outcomes. Digit J Ophthalmol 2015;21:1-15. doi: 10.5693/djo. 01.2015.10.001.
3. Waterhouse WJ, Lloyd MA, Dugel PU, Heuer DK, Baerveldt G, Minckler DS, *et al*. Rhegmatogenous retinal detachment after molteno glaucoma implant surgery. Ophthalmology 1994;101:665-71.
4. Banitt MR, Feuer WJ, Schiffman JC, Parrish RK II. Adverse vitreoretinal outcomes of glaucoma drainage devices based on verified and unverified financial claims data. Ophthalmic Surg Lasers Imaging Retina 2015;46:463-70.
5. Law SK, Kalenak JW, Connor TB Jr, Pulido JS, Han DP, Mieler WF. Retinal complications after aqueous shunt surgical procedures for glaucoma. Arch Ophthalmol 1996;114:1473-80.
6. Verma S, Azad SV, Takkar B, Temkar S, Chawla R, Venkatesh P. Posterior segment complications following glaucoma surgeries. Indian J Ophthalmol 2020;68:988-93.
7. Benz MS, Scott IU, Flynn HW Jr, Gedde SJ. Retinal detachment in patients with a preexisting glaucoma drainage device: Anatomic, visual acuity, and intraocular pressure outcomes. Retina 2002;22:283-7.
8. Babu N, Baliga G, Puthuran GV, Ramasamy K. Retinal detachment in eyes treated with Aurolab aqueous drainage implant for refractory glaucoma - Incidence and outcomes. Indian J Ophthalmol 2022;70:1287-93.
9. Dhami A, Shah KK, Ratra D. Pneumatic retinopexy outcomes as primary or secondary surgical option for treating rhegmatogenous retinal detachment. Indian J Ophthalmol 2018;66:420-5.

Access this article online

Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_3149_21

Cite this article as: Ratra D, Mohan S. Commentary: Glaucoma drainage device and retinal detachment. Indian J Ophthalmol 2022;70:1293-4.